

THE AMERICAN BIOLOGY TEACHER

Editorial Staff

Editor:	William F. McComas Parks Family Professor of Science Education University of Arkansas ABTEditor@nabt.org
Assistant Editor:	Kathleen Westrich Ronald Wilson Reagan College Preparatory H.S. kmwestrich@yahoo.com
Reviewing Editors:	William H. Heyborne Southern Utah University williamheyborne@suu.edu Kevin Bonney New York University kevin.bonney@nyu.edu Emily Weigel Michigan State University emilyweigel@gmail.com Lance Forshee Southern Utah University lanceforshee@suu.edu
Managing Editor:	Valerie Haff managingeditor@nabt.org
ABT Production Office:	P.O. Box 3363 Warrenton, VA 20188 Phone: (888) 501-NABT Web site: www.nabt.org
Contributing Columnist:	Douglas Allchin University of Minnesota allch001@umn.edu

In Appreciation

Christine S. Chantry • 1952–2003

Department Editors

Book Reviews: Amanda Glaze, aglaze@georgiasouthern.edu
Classroom Materials & Media Reviews: Jeremy D. Sacks, sackjeffrey@comcast.net

Advertising Sales

Kim Daniele, Account Executive, MCI USA
410-584-1981, kim.daniele@mci-group.com

Guidelines for Authors

Guidelines for authors may be found at
<http://www.nabt.org/publications>

Printed by The Sheridan Press, on Forest Stewardship Council®-certified paper
© 2019 National Association of Biology Teachers All rights reserved.

The American Biology Teacher (ISSN 0002-7685, e-ISSN 1938-4211) is published nine times a year (monthly except June and July, Nov/Dec combined) for the National Association of Biology Teachers in collaboration with University of California Press, 155 Grand Avenue, Suite 400, Oakland, CA 94612-3764. Periodicals postage paid at Oakland, CA, and additional mailing offices. POSTMASTER: Send address changes to ABT, University of California Press, 155 Grand Avenue, Suite 400, Oakland, CA 94612-3764. E-mail: customerservice@ucpress.edu.

The American Biology Teacher is the official peer-reviewed journal of the National Association of Biology Teachers. All manuscripts must be submitted online at <http://mc.manuscriptcentral.com/ucpress-abt>. The comments and opinions expressed in this publication are not attributed to and do not necessarily represent the views of the National Association of Biology Teachers. Announcements and advertisements in this journal for products do not imply endorsement of or by NABT.

Membership Information

NABT membership is \$79 a year for full membership and \$149 for organizational membership in the United States, Canada, and Mexico; \$150 for full membership elsewhere. \$48 of annual membership dues applies to a subscription of *The American Biology Teacher*. Student, adjunct faculty and early career teacher memberships are \$35 and retired membership is \$60 (\$35 online only) if that person has been an NABT member for 10 years or more and is retired.

Subscriptions are offered on a calendar-year basis; members and subscribers receive all issues in the volume for the year in which their subscription is entered.

See <http://abt.ucpress.edu/content/subscriptions-and-single-issues> for single issue and institutional subscription orders, back issues from volume 69 forward, and claims information. Domestic claims for nonreceipt of issues should be made within 90 days of the mail date; overseas claims within 180 days. Mail dates can be checked at: <http://www.ucpress.edu/journals.php?p=release>. UC Press does not begin accepting claims for an issue until thirty (30) days after the mail date. For back issues before volume 69, contact NABT at publication@nabt.org.

Inquiries about advertising can be sent to abt@networkmediapartners.com. For complete abstracting and indexing coverage for the journal, visit <http://abt.ucpress.edu>. All other inquiries can be directed to customerservice@ucpress.edu.

Copying and permissions notice: Authorization to copy article content beyond fair use (as specified in Sections 107 and 108 of the U.S. Copyright Law) for internal or personal use, or the internal or personal use of specific clients, is granted by The Regents of the University of California on behalf of the National Association of Biology Teachers for libraries and other users, provided that they are registered with and pay the specified fee through the Copyright Clearance Center (CCC), www.copyright.com. To reach the CCC's Customer Service Department, phone 978-750-8400 or write to info@copyright.com. For permission to distribute electronically, republish, resell, or repurpose material, use the CCC's Rightslink service, available on JSTOR at <http://abt.ucpress.edu>. Submit all other permissions and licensing inquiries through University of California Press's Reprints and Permissions web page, <http://www.ucpress.edu/journals.php?p=reprints> or via email jpermissions@ucpress.edu.

For more information, visit www.nabt.org

Executive Director

Jaelyn Reeves-Pepin

Board of Directors

President: Sherry Annee
President-Elect: Sharon Gusky
Past President: Elizabeth Cowles
Secretary/Treasurer: Steven Christenson
Director-at-Large: Lindsey Carter
Director-at-Large: Brian Dempsey
Director/Coordinator: Anna Hiatt
Director/Coordinator: Julie Angle

Regional Coordinators

Region I (CT, ME, MA, NH, RI, VT): Margaret Carroll
Region II (DE, DC, MD, NJ, NY, PA, VA): Karen Lucci
Region III (IL, IN, MI, OH, WI): Kevin English
Region IV (IA, KS, MN, MO, NE, ND, SD): Anna Hiatt
Region V (KY, NC, SC, TN, WV): Kim Sadler
Region VI (AL, FL, GA, LA, MS, PR): Madelene Loftin
Region VII (AZ, AR, NM, OK, TX): Julie Angle
Region VIII (CO, ID, MT, NV, UT, WY): Cindy Gay



Region IX (AK, CA, HI, OR, WA, Pacific Territories): Camden Hanzlick-Burton
Region X (Canadian Provinces & Territories): TBD

Committee Chairs

ABT Journal Advisory Committee: William F. McComas
Archival Committee: Carrie Bucklin & Jill Maroo
Awards Committee: Jason Crean
Citizen Science Committee: TBD
Finance Committee: Steve Christenson
Honorary Membership Committee: Sharon Gusky
Member Resources Committee: Catherine Ambos
Nominating Committee: Donald French
Professional Development Committee: Kristina Nicosia
Retired Members Committee: Dennis Gathmann

Section Chairs

AP Biology Section: Mark Little
BioClub Section: Chris Monsour
Four-Year College & University Section: Kathy Gallucci
Two-Year College Section: Tara Jo Holmberg